

What is claimed is:

- 1           A copper-clad board suitable for making a hole  
with a carbon dioxide gas laser, which copper-clad board is  
5   obtained by disposing a double-side-treated copper foil  
provided with a metallic-treatment layer having a high  
absorption rate of a carbon dioxide gas laser energy on at  
least one surface, at least on an outer layer of a  
thermosetting resin composition layer such that the  
10   metallic-treatment layer is formed on a shiny surface of  
the copper foil which shiny surface is to be a surface  
layer, and laminate-forming the double-side-treated copper  
foil and the thermosetting resin composition layer under  
heat and pressure, to make an alloy of the metallic-  
15   treatment layer and the copper by the above heating.
2.           A copper-clad board according to claim 1,  
          wherein the metallic-treatment layer is a layer which  
contains nickel or nickel and cobalt as essential  
20   components.
3.           A copper-clad board according claim 1,  
          wherein the thermosetting resin composition is a  
resin composition containing a polyfunctional cyanate ester  
25   monomer and/or a prepolymer of said cyanate ester as  
essential components.
4.           A copper-clad board according to claim 1,  
          wherein the thermosetting resin composition contains  
30   10 to 80 % by weight of an insulating inorganic filler.
5.           A copper-clad board according to claim 1,

wherein the double-side-treated copper foil is a product formed by attaching a B-staged thermosetting resin composition layer to a surface opposite to the surface having the metallic-treatment layer and heating the resultant set under pressure to make an alloy of the metal of the metallic-treatment layer with the copper.

6. A copper-clad board according to claim 1, wherein the double-side-treated copper foil is an electrolytic copper foil.

7. A copper-clad board according to claim 1, wherein the double-side-treated copper foil is a product formed by attaching a thermosetting resin composition sheet to a surface opposite to the surface having the metallic-treatment layer and heating the resultant set under pressure to make an alloy of the metal of the metallic-treatment layer with the copper.

8. A copper-clad board according to claim 7, wherein the thermosetting resin composition sheet is a polyimide film.

9. A copper-clad board according to claim 7, wherein the thermosetting resin composition sheet is a thermosetting resin composition containing a polyfunctional cyanate ester monomer and/or a prepolymer of said cyanate ester as essential components.

10. A copper-clad board according to claim 5, wherein the double-side-treated copper foil is a product formed by disposing a protective sheet on the

metallic-treatment surface of the double-side-treated copper foil and partially bonding the protective sheet to the double-side-treated copper-foil.

5 11. A copper-clad board according to claim 10,  
wherein the protective sheet is a metal foil or a resin film.

10 12. A copper-clad board according to claim 1,  
which is a copper-clad board obtained by the use  
of a metal-foil-carrier-attached copper foil in which metal  
foil(s) is/are disposed on one surface or both the surfaces  
of the double-side-treated copper foil and the metal  
15 foil(s) is/are partially bonded to the double-side-treated  
copper foil.

13. A copper-clad board according to claim 12,  
wherein the metal-foil-carrier-attached copper  
foil and the thermosetting resin composition layer are  
20 laminate-formed to obtain a copper-clad board and then the  
metal foil of the carrier is peeled off.

14. A copper-clad board according to claim 12,  
wherein the metal foil carrier is an aluminum  
25 foil having a thickness 200 to 500  $\mu\text{m}$ .

sub B >  
30 15. ~~A method of making a hole in a copper-clad board,  
in which the metallic-treatment layer surface of the  
copper-clad board recited in claim 1 is directly irradiated  
with a carbon dioxide gas laser having an energy sufficient  
for processing a copper foil by means of the pulse  
oscillation of the carbon dioxide gas laser, to make a~~

end B, penetration hole and/or a blind via hole.

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16. A method according to claim 15,  
wherein the energy of the carbon dioxide gas  
5 laser is 5 to 60 mJ.

17. A method according to claim 15,  
wherein, after the hole is made with a carbon  
dioxide gas laser, copper foil burrs occurring around the  
10 hole are removed and at the same time parts of surface  
copper foils are two-dimensionally etched in the thickness  
direction.

18. A method according to claim 15,  
15 wherein the penetration hole and/or the blind via  
hole has a diameter of 80 to 180  $\mu\text{m}$ .

19. A printed wiring board which is prepared by  
directly irradiating a copper foil surface of the copper-  
20 clad board recited in claim 1 with a carbon dioxide gas  
laser having an energy of 10 to 60 mJ, to make a  
penetration hole and/or a blind via hole.

20. A printed wiring board according to claim 19,  
25 wherein the penetration hole and/or the blind via  
hole has a diameter of 80 to 180  $\mu\text{m}$ .

21. A printed wiring board according to claim 19,  
wherein, after the hole is made with a carbon  
30 dioxide gas laser, copper foil burrs occurring in a hole  
portion are dissolved and removed with a chemical and at  
the same time parts of surface copper foils are two-

dimensionally dissolved and removed in the thickness direction.

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a. 22. A printed wiring board according to claim 19,  
5 wherein the double-side-treated copper foil  
recited in claim 5 is disposed on at least one surface of  
an internal board such that the copper foil side faces  
outside, the resultant set is laminate-formed under heat  
and pressure to obtain a copper-clad board, and the upper  
10 surface of the copper-clad board is directly irradiated  
with a carbon dioxide gas laser having an energy sufficient  
for making a hole in a copper foil, to make the penetration  
hole and or the blind via hole.

15 23. A printed wiring board according to claim 22,  
wherein, after the formation of the hole with the  
carbon dioxide gas laser, copper foil burrs fluffing on a  
hole portion of the copper-clad board are dissolved and  
removed with a chemical and at the same time surface copper  
20 foils of the copper-clad board are two-dimensionally  
dissolved and removed in the thickness direction to some  
extent.